FlyBy Math™ Alignment
Voluntary State Curriculum
Mathematics

Standard 1.0 Knowledge of Algebra, Patterns, and Functions
Students will algebraically represent, model, analyze, or solve mathematical or real-world problems involving patterns or functional relationships.

Topic C. Numeric and Graphic Representations of Relationships

Indicator 1. Locate points on a number line and in a coordinate grid

Objectives	*FlyBy Math*™ Activities
b. Create a graph in a coordinate plane	--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.

Standard 3.0 Knowledge of Measurement
Students will identify attributes, units, or systems of measurements or apply a variety of techniques, formulas, tools or technology for determining measurements.

Topic B. Measurement Tools

Indicator 1. Measure in customary and metric units

Objectives	*FlyBy Math*™ Activities
a. Select and use appropriate tools and units	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation. --Conduct simulation and measurement for several aircraft conflict problems.

Topic C. Applications in Measurement

Indicator 2. Calculate equivalent measurements

Objectives	*FlyBy Math*™ Activities
a. Determine start, elapsed, and end time	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

Standard 4.0 Knowledge of Statistics Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.	
Topic A. Data Displays	
Indicator 1. Collect, organize, and display data	
Objectives a. Collect data by conducting surveys to answer a question.	***FlyBy Math™* Activities** --Conduct simulation and measurement for several aircraft conflict problems.
c. Organize and display data in line plots	--Represent distance, rate, and time data using line plots, bar graphs, and line graphs.
e. Organize and display data in line graphs	--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.
f. Determine the appropriate type of graph to effectively display data	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
Topic B. Data Analysis	
Indicator 1. Analyze data	
Objectives b. Interpret and compare data in line plots	***FlyBy Math™* Activities** --Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.

Standard 7.0 Process of Mathematics Students demonstrate the processes of mathematics by making connections and applying reasoning to solve problems and to communicate their findings.	
Topic A. Problem Solving	
Indicator 1. Apply a variety of concepts, processes, and skills to solve problems	
Objectives c. Make a plan to solve a problem	***FlyBy Math™* Activities** --Use calculations and experimental evidence to predict, describe, and explain several aircraft conflict problems.
d. Apply a strategy, i.e., draw a picture, guess and check, finding a pattern, writing an equation	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
e. Select a strategy, i.e., draw a picture, guess and check, finding a pattern, writing an equation	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.

f. Identify alternative ways to solve a problem	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
h. Extend the solution of a problem to a new problem situation	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.
Topic B. Reasoning	
Indicator 1. Justify ideas or solutions with mathematical concepts or proofs	
Objectives	***FlyBy Math™* Activities**
a. Use inductive or deductive reasoning	--Predict the relative motion of two airplanes on given paths. --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
b. Make or test generalizations	--Predict the relative motion of two airplanes on given paths. --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
c. Support or refute mathematical statements or solutions	--Predict outcomes and explain results of mathematical models and experiments.
Topic C. Communications	
Indicator 1. Present mathematical ideas using words, symbols, visual displays, or technology	
Objectives	***FlyBy Math™* Activities**
a. Use multiple representations to express concepts or solutions	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
b. Express mathematical ideas orally	--Predict outcomes and explain results of mathematical models and experiments.
c. Explain mathematical ideas in written form	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

d. Express solutions using concrete materials	--Use calculations and experimental evidence to predict, describe, and explain several aircraft conflict problems.
e. Express solutions using pictorial, tabular, graphical, or algebraic methods	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
f. Explain solutions in written form	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
Topic D. Connections	
Indicator 1. Relate or apply mathematics within the discipline, to other disciplines, and to life	
Objectives b. Identify mathematical concepts in relationship to other disciplines	***FlyBy Math™* Activities** --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
c. Identify mathematical concepts in relationship to life	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.